REMARKS

The Office Action mailed on September 25, 2003, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 1-18 and 21-25 were pending in the present application, with claims 6-8, 10, 11 and 13-18 being provisionally withdrawn from consideration.[1] By this paper, Applicants cancel claims 12, 15, 21 and 22-23 without prejudice or disclaimer, and add claims 26 and 27. Therefore, claims 1-11, 12-14, 16-17, and 24-26 are now pending in the present application.

Applicants respectfully submit that the present application is in condition for allowance for the reasons that follow.

Rejections Under 35 U.S.C. § 112, First Paragraph

Claims 1-5, 9, 12 and 23-25 stand rejected under 35 U.S.C. §112, first paragraph, as lacking enablement. Claim 12 has been cancelled. Applicants respectfully disagree that one of skill in the art would not be able to practice the inventions as claimed.

In issuing the rejection, the Office Action utilizes "applicant's arguments" contained in a prior response as a basis to reject the claims under 35 U.S.C. §112, first paragraph. First, Applicants respectfully submit that such a conclusion was not the conclusion that Applicants had in mind, and apologize in advance for any misunderstanding. The last response simply pointed to the fact that the previous Office Action was incorrect in stating that the Applicants' specification taught that TiO_2 "is a known Superhydrophilic substance,"[2] and was, therefore, incorrect in relying solely on Applicants' disclosure for such a teaching to *anticipate* claim 1. Applicants disclosure states that "TiO_2 has an ion exchanging ability and/or a superhigh hydrophilic *property*." (page 7, lines 23-24, emphasis added.) Applicants' disclosure immediately goes on to state that it "*is generally known* that TiO_2 shows a superhigh hydrophilic property *when* it is used in combination with an SiO_2 binder." (page 7, lines 24-26, emphasis added.) That is, Applicants' disclosure does not state that *it is known* that TiO_2 alone exhibits superhigh hydrophilic properties, and, therefore, Applicants' disclosure cannot

[1] Applicants request, later in this paper, that some of these claims now be considered.

[2] "TiO_2 as set forth by applicant (see specification page 7, ln 24+) is a known Superhydrophilic substance." (March Office Action, page 3.)

be used as the basis to assert that it would be known that a reference teaching only TiO_2 teaches all of the elements of claim 1. Thus, the grounds for asserting that the claims of the invention were *anticipated* by Skarpelos were flawed, as there was no specific teaching that TiO_2 is used in Skarpelos as a superhigh hydrophilic substance.[3]

Still, if Applicants' arguments are construed as an assertion that TiO_2 without SiO_2 cannot have superhigh hydrophilic properties, such an assertion is respectfully withdrawn.

Second, even if a binder must be used with TiO_2, Applicants' note that in the election requirement, one of the species (that was later elected) was classified where "*the ion exchange material* is TiO_2 and ZrO_2 only." (See restriction requirement, page 5, line 3.) Since SiO_2 is a binder, and not an ion exchange material, the elected species does not prevent the utilization of TiO_2 and/or ZrO_2 with a binder such as SiO_2.

* * * * *

Still further, Applicants respectfully submit that the statements contained in the office action regarding enablement contradict the Office Action's position on the prior art. That is, the Office Action rejects claims 1-5 and 23-25 as anticipated, yet a claim is anticipated only if each and every limitation is found in a single prior art reference. *Verdegaal Bros. v. Union Oil*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); see MPEP§2131. Indeed, to be anticipatory, a reference must contain an "enabling disclosure." *In re Hoeksema*, 399 F.2d 269, 273 (CCPA 1968).

Consequently, the position of the Office Action on §112 enablement contradicts its position on the prior art. If it is truly believed that the inventions according to claims 1-5 and 23-25 are taught or suggested by the prior art (which does not teach the use of a binder), then the §112 enablement rejection should be withdrawn. On the other hand, if it is truly believed that an ordinarily skilled artisan (with the benefit of Applicants' claims and specification along the presumptive knowledge of the prior art) would be incapable of making and using the claimed inventions without a binder, then the prior art rejections should be withdrawn.

[3] The requirements for anticipation are strict. A reference must teach, either expressly or inherently, each and every element of a claim. (Discussed in greater detail below.)

Applicants again apologize for any confusion that their previous statements may have caused. In view of the above, Applicants respectfully submit that the office action is applying an incorrect standard for enablement. A person of ordinary skill in the art – given Applicants' specification – would have been able to make and use the claimed inventions.

Rejections Under 35 U.S.C. §112, Second Paragraph

In the Office Action, claims 1-5, 9, 12 and 23-25 are rejected under 35 U.S.C. §112, second paragraph as failing to set forth the subject matter which Applicants regard as their invention. As seen above, the present invention is not different from what is defined in the claims, and Applicants respectfully request reconsideration.

Also, claims 1-5, 9, 12 and 23-25 are rejected under 35 U.S.C. §112, second paragraph as being indefinite. As seen above, claim 1 has been amended. Reconsideration is respectfully reauested.

In regard to claim 5, as explained above, the present invention does not omit an essential element, because SiO_2 is not essential to practice the invention of claim 5.

Rejections Under 35 U.S.C. § 102

Claims 1-5 and 23-25 stand rejected under 35 U.S.C. §102(b) as being anticipated by Skarpelos (USP 5,028,384). In response, Applicants respectfully submit that claims 1-5 and 23-25 are allowable for the reasons that follow.

Applicants rely on MPEP § 2131, entitled "Anticipation – Application of 35 U.S.C. 102(a), (b), and (e)," which states that a "claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." It is respectfully submitted that Skarpelos does not describe each and every element of independent claims 1 and 4.

Claim 1 recites that a surface of the separating and removing apparatus "is adapted to *trap thereon* radioactive corrosion products contained in water drops so that radioactive corrosion products firmly adhere to the surface." (Emphasis added.) The Office Action asserts that the phrase "adapted to" does not serve to patentably distinguish the claimed

structure over prior art references, and thus the above quoted element was not given patentable weight as a structural limitation, and the element was deemed not needed to be identified by the PTO in Skarpelos (it could not have been identified in Skarpelos), as the reference does not contain this teaching. Applicants respectfully submit that this is an incorrect assertion as a matter of law.

Applicants respectfully assert that "adapted to *trap thereon* radioactive corrosion products contained in a plurality of water drops so that radioactive corrosion products firmly adhere to the surface" should be given patentable weight as a structural limitation because the claim presents structural attributes of the present invention. In support of this assertion, Applicants rely on the second and third paragraphs of MPEP § 2173.05(g), which state that a "functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a persion of ordinary skill in the pertinent art" and that "the Court held that limitations such as 'members ***adapted to*** be positioned' and 'portions . . . being resiliently dilatable whereby said housing may be slidably positioned' serve to precisely define present structural attributes of interrelated component parts of the claimed assembly. *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976)." (Emphasis added) *Venezia* has been cited in at least three published board of appeals and interferences cases since 1988.

The Office Action cites a series of cases that are alleged to support the position that the language following "adapted to" should be ignored. All of the cases, save for *Masham*, are CCPA cases decided before 1976, and, assuming *arguendo* that these cases are on point, are therefore overruled by the 1976 decision in *Venesia*. *Masham*, decided in 1987, is a Board of Patent Appeals and Interferences case, and thus cannot contradict the holding of a United States federal appellate court (who decided *Venesia*). Still further, later boards have cited *Venesia*. Therefore, the language following the phrase "adapted to" does indeed serve to impart a structural recitation onto the claims that must be present in a single prior art reference to anticipate the independent claims. Skarpelos does not teach this element, and therefore cannot anticipate the independent claims, as will now be shown.

The invention covered by claim 1 traps/holds the radioactive corrosion products. In an exemplary scenario utilizing the invention of claim 1, steam in a reactor is directed through a separating and removing apparatus, and water drops containing radioactive

corrosion products fall on corrugated plates according to the present invention and stick to the plates. When these drops dry, the radioactive corrosion products adhere in films to the surfaces of the corrugated plates, thus remaining on the plates.

In contrast, Skarpelos teaches oxidizing catalysts providing a means for oxidation of ammonia to nitrates or nitrites. "Nitrogen . . . in more volatile forms such as ammonia, are oxidized to non-volatile, water soluble forms comprising nitrates (NO-3) and/or nitrites (NO-2) by catalytic oxidation." (Skarpelos, col. 4, lines 50-55.) That is, in Skarpelos, the corrosion products are merely converted to a non-volatile substance. Skarpelos does not disclose, teach, or suggest that radioactive corrosion products are trapped anywhere. Instead, in Skarpelos, some corrosion products are merely converted to a non-volatile compound. Thus, the corrosion products are not trapped on a surface: the corrosion products cannot be trapped anywhere, because they are converted to a non-volatile product.

Simply because Skarpelos discloses a component coated with TiO_2 does not mean that the component traps radioactive corrosion products contained in water drops so that the corrosion products adhere to the surface. Even assuming *argudeno* that TiO_2 by itself may exhibit superhigh hydrophilic properties,[4] there is no indication that the Skarpelos components inherently trap radioactive corrosion products. A "claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (MPEP § 2131, "Anticipation – Application of 35 U.S.C. 102(a), (b), and (e)"). Since Skarpelos does not expressly teach each element of claim 1, and no evidence has been proffered that the components of Skarpelos inherently trap radioactive corrosion products as claimed, the Office Action has failed to make out a proper case for anticipation of claim 1.

* * * * *

Claim 4 recites a radioactive separating and removing apparatus employing a metal or a metal oxide as an ion-exchange material that exchanges ions for radioactive ions. Claim 4 also utilizes the phrase "adapted to" to recite a structural element.

---

[4] Again, it is noted that the Office Action asserts that Applicants' disclosure sets forth that TiO_2 "is a known Superhydrophilic subastance." This is not the case. Applicants' disclosure states that TiO_2 exhibits superhigh hydrophilic properties, and further states that *it is known* that TiO_2 in combination with a binder shows superhigh hydrophilic properties. That is, Applicants' disclosure does not state that *it is known* that TiO_2 alone exhibits superhigh hydrophilic properties.

As discussed above regarding claim 1, the Skarpelos reference merely converts corrosion products into non-volatile compounds in a chemical reaction. Skarpelos is completely silent in teaching an ion-exchange material that exchanges ions for radioactive ions. Thus, claim 4 is allowable.

Further, the claims that depend from claims 1 and 4 are allowable at least due to their dependency from allowable claims.

Claim Rejections Under 35 U.S.C. §103(a)

In the Office Action, dependent claims 1-5 and 23-25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Skarpelos in view of admitted prior art or Zeng (JP 11-285635, US equivalent USP 6,217,999) and Hayakawa et al (W0 96/29375). Applicants respectfully traverse the rejection as to the claims above, and submit that these claims are allowable for at least the following reasons.

Applicants rely on MPEP § 2143, which states that:

> [t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

It is respectfully submitted that at least the first and third criteria of MPEP § 2143 have not been met in the Office Action.

The Cited References Do Not Suggest All Claim Recitations

Even if the first requirement of MPEP § 2143 was satisfied in the Office Action (which it is not, as explained below), the cited references still do not meet the third requirement, which is that "the prior art reference (or references when combined) must teach or suggest all the claim limitations."

In formulating the obviousness rejection, Skarpelos is relied on to teach the recitations of independent claims 1 and 4. As seen above, Skarpelos does not teach each and every recitation of claims 1, since it fails to teach a surface adapted to trap radioactive corrosion products so that the radioactive corrosion products firmly adhere on the surface of the dryer of Skarpelos, in order to separate and remove the products from the water drops. In regards to claim 4, Skarpelos fails to teach a radioactive material separating and removing apparatus employing a metal or metal oxide as an ion-exchange material adapted to exchange ions for radioactive ions.

As already explained, in Skarpelos, the corrosion products are merely converted to a non-volatile substance. Skarpelos does not disclose or suggest that radioactive corrosion products are trapped anywhere or that Skarpelos exchanges ions for radioactive ions. Instead, in Skarpelos, the corrosion products are merely converted to a non-volatile compound. Thus, the corrosion products are not trapped, nor are ions exchanged for radioactive ions.

The Office Action asserts that "Skarpelos discloses applicant's *inventive concept*," with the possible exception of teaching a superhigh hydrophilic substance. (Office Action, page 8, second paragraph, emphasis added.) This is not the case. As seen above, Skarpelos teaches or suggests neither trapping radioactive corrosion products nor exchanging ions with radioactive ions. Thus, the "inventive concept" is not disclosed in Skarpelos, and, therefore, even though the prior art may have taught that utilizing TiO_2 in combination with a binder results in a superhigh hydrophilic material, no evidence has been proffered that by simply adding a binder to Skarpelos, Skarpelos can be transformed from a device that converts volatile compounds to a device for trapping radioactive material. Thus, even after the proffered modification, each and every element of claims 1 and 4 are still not present..

In sum, even if the first requirement of MPEP § 2143 is satisfied, the third requirement of MPEP § 2143 is not satisfied in the Office Action, since the cited references do not teach each and every element of the present invention. Thus, the present claims are allowable.

Lack of Suggestion or Motivation to Modify or Combine the References

MPEP § 2143.01 states that "the prior art *must* suggest the desirability of the invention." (MPEP § 2143.01, subsection 1, emphasis added.) The Office Action relies solely on the Applicants' disclosure for motivation to modify Skarpelos to arrive at the invention of claims 1 and 4. The Office Action cites nothing **in the prior art** that provides motivation to modify Skarpelos to arrive at Applicants' invention. There is nothing in the prior art that suggests the desirability of Applicants' invention, and the Office Action does not provide evidence that motivation to modify Skarpelos is in the knowledge generally available to one of ordinary skill in the art.

The Office Action does not identify a reason why Skarpelos would be combined with Zhang to teach the elements of Applicants' invention. The Office Action simply relies on an argument that

> modification of Skarpelos to have included the known Superhydrophilic substance teachings (i.e., incorporation of a binder material) would have been obvious to one having ordinary skill in the art at the time the invention was made as such results are in no more than the use of conventionally known materials/designs available within the art.

(Office Action, page 8, 4th paragraph.) That is, it would have been obvious to modify Skarpelos because such modification relies only on materials already known in the art. First, the mere fact that all of the elements of an invention may be known distinct from one another in the art does not provide motivation to combine the art. Indeed, if such was the case, the first requirement of MPEP § 2143.01 would be completely eviscerated. Second, this is circular reasoning at best, but is more like impermissible hind sight on the part of the PTO. Applicants provide a rationale for trapping or exchanging radioactive material. It appears that the office action is utilizing the Applicants' own disclosure against them for motivation to modify the prior art.

* * * * *

MPEP § 2143.01, subsection 6 states that "the proposed modification cannot change the principle of operation of a reference – If the proposed modification or combination of the

prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959)." In *Ratti*, the CCPA held that the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in the primary reference." This substantial redesign would have resulted in changing a rigid seal to a resilient seal. Thus, a reference cannot be modified if the modification changes the principle of operation of the reference.

With the above in mind, it is respectfully submitted that since Skarpelos teaches that volatile substances are converted to non-volatile substances as its principle of operation, the addition of a binder material into Skarpelos (assuming *arguendo* that such was possible and that such modification would result in the claimed inventions) so that Skarpelos trapped or exchanged radioactive material would change the principle of operation of the Skarpelos reactor. Since modifying Skarpelos to utilize a binder changes the principle of operation of Skarpelos, "the teachings of [Skarpelos] are not sufficient to render the claims *prima facie* obvious."

Claims 9 and 12

In the Office Action, dependent claims 9 and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Skarpelos in view of Cowan II (USP 5,465,278). Applicants cancel claim 12, and respectfully traverse the rejection of claim 9 for at least the pertinent reasons detailed above, and that Cowan II, being directed towards monitoring an electrochemical potential near a weldment in a pressure vessel, is completely silent in regard to a radioactive separating and removing apparatus employing a metal or a metal oxide as an ion-exchange material that exchanges ions for radioactive ions. Because Cowan II does not remedy the deficiencies of Skarpelos, claim 9 is allowable.

Still further, Claim 9 is also allowable for at least the reason that neither Skarpelos nor Cowan II disclose, teach, or suggest a corrugated plate having a p-type oxide film coating with an ion-exchange material on the p-type oxide film. Claim 9 was identified in the Office Action as being a product-by-process claim, just as it was identified in the prior Office Action. Claim 9 was amended in the prior response to remove the product-by-process language. However, claim 9 is again amended so that all possible product-by-process

language has been removed. Applicants respectfully request that the PTO reconsider this claim in view of these amendments.

Skarpelos does teach depositing oxidizing catalysts on a steam separator and/or a dryer unit. However, this is not the same as a component with a layer comprising an ion-changing material and a layer comprising a p-type oxide film. Because Skarpelos is silent in regard to this element, claim 9 is allowable for this additional reason as well.

New Claims

Applicants have added new claims 26-27. These claims are allowable at least due to the pertinent reasons discussed above. Namely, that Skarpelos, alone or after modification in view of Zhang and/or Cowan II, does not disclose or suggest a reactor having corrugated plates including an ion-exchange material adapted to exchange ions for radioactive ions. Allowance of these claims is respectfully requested.

Withdrawn Claims

Applicants respectfully request that claims 6, 7, 10, 11 and 13-14 and 16-18 be considered and allowed because those claims depend, either directly or indirectly, from claim 4, and thus no examination of these claims under 35 U.S.C. §§ 102 and 103 is necessary.

Conclusion

Applicants believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to

Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Keith is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date Febry 25, 2004

By _____

FOLEY & LARDNER
Washington Harbour
3000 K Street, N.W., Suite 500
Washington, D.C. 20007-5143
Telephone: (202) 295-4747
Facsimile: (202) 672-5399

Martin J. Cosenza
Attorney for Applicant
Registration No. 48,892